

AERODYNE "AEROMAGIC" RECEIVER

Circuit.—The combined first detector-oscillator valve, FC4 met. (V1), is preceded by a band-pass aerial tuner with iron-cored coils. Bias is obtained by A.V.C. and cathode resistances R2 and R19. The latter is variable and mounted in the remote control unit to provide volume control. It is common to V1 and V2.

Tuning of the oscillator section is in the grid circuit. The following coupling is a band-pass I.F. transformer. The intermediate frequency is crystal controlled, and as the adjustment is particularly difficult, the I.F. transformers should not be disturbed. Radio frequency circuits may be aligned as described in "General Notes."

The I.F. valve, VP4B met. (V2), is biased in the same manner as V1 and is followed by a second I.F. transformer.

The second detector valve 2D4A met. (V3) uses one anode for signal rectification and the other for A.V.C. The coupling to the output valve is by resistance capacity filter R18, R7 (diode load), C15 and R12. The A.V.C. diode anode is coupled to the primary of I.F.T.2.

The monitor valve, Pen4VB met. (V4) is used to operate the control valve, V6, by having in its anode circuit the crystal controlled I.F. circuit, the capacity of the crystal being neutralised by a series condenser C30. V4 amplifies only the I.F. signal to which the tuned anode circuit will resonate, and the amplified I.F. is fed to the grid of V6 through C16.

In this way the anode current of V6 (354V met.) is caused to vary only when the carrier is accurately tuned-in. In the anode

circuit of this valve is a relay which operates the motor and the muting switch for the speaker.

The output valve, Pen4VB (V5) is employed in the orthodox manner with grid stabilising resistance and variable tone control in the anode circuit.

Mains equipment consists of a special transformer, full-wave rectifier, R3, and the field coil used in conjunction with electrolytic condensers for smoothing.

Special Notes.—The tuning indicator on the remote control is virtually a voltmeter connected across part of a potentiometer, R20, which is in parallel with a 41-volt winding on the transformer. R20 is ganged with the tuning condenser so that the voltage registered on the voltmeter should give an accurate reading of the setting of the ganged condenser. So that the reading may be adjusted accurately, the mains transformer is provided with an additional +10 volt tapping.

The motor for driving the condenser is a special reversible type with a clutch to prevent overrunning a station when the relay switches it off.

In the connecting cable the leads are coded as follows (see numbering on diagram):—

- 0, green (mains); 1, pink (mains);
- 2, orange (earth); 3, black (relay to press button);
- 4, red (to reversing switch); 5, blue (to reversing switch);
- 6, green or grey (V.C.); 7, yellow (R20 to meter);
- 8, white (reverse); 9, brown or black (forward).

The motor is a self-starting induction type, the starting and phase reversal being performed by a centre tapped 18-volt winding on the transformer, while a 250-volt winding provides the driving power. The motor should run clockwise for forward. If not, reverse the leads to pins 4 and 5 of cable.

Quick Tests.—Voltages between the terminal tags on the speaker transformer and chassis (no signal and volume control at maximum):—

Top (1) blue, 205 volts, V5 anode; (2) red, 215 volts, H.T. smoothed; (3) black, 255 volts, H.T. unsmoothed.

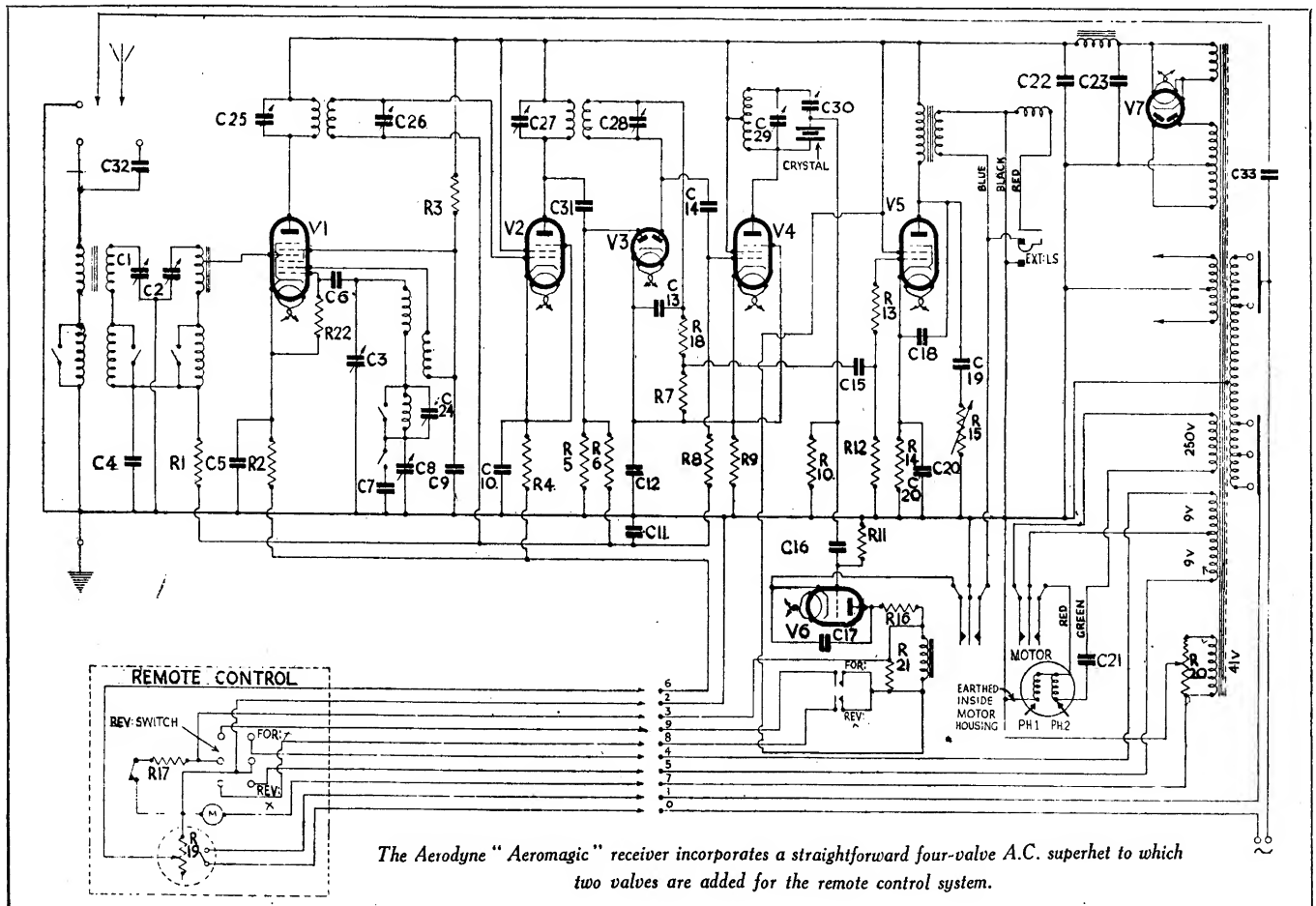
Removing Chassis.—Undo the knobs, remove two screws from dial, remove four holding screws from underneath, and lift out the chassis.

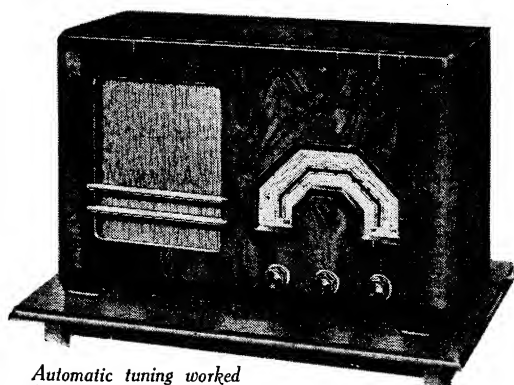
General Notes.—Except for the control valves and circuits the receiver is an orthodox four-valve superhet. As the working of the control is not affected by the efficiency of V4 and V6 within wide limits, the ordinary circuit tests are applicable.

The only tuned circuits which should be adjusted outside the factory are the oscillator and band-pass tuners. The following is the method by which alignment should be carried out:—

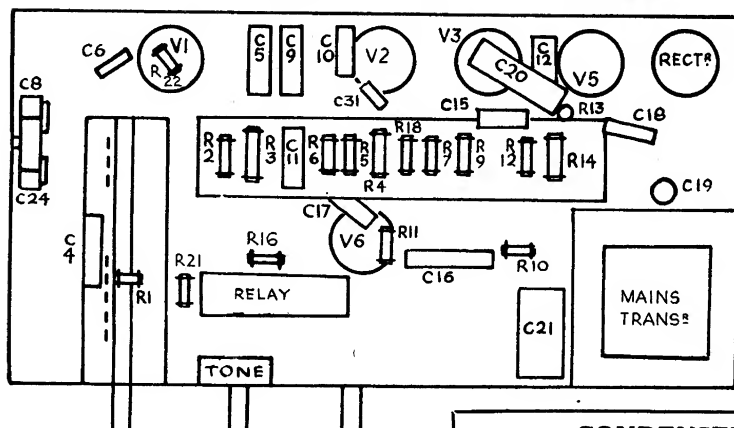
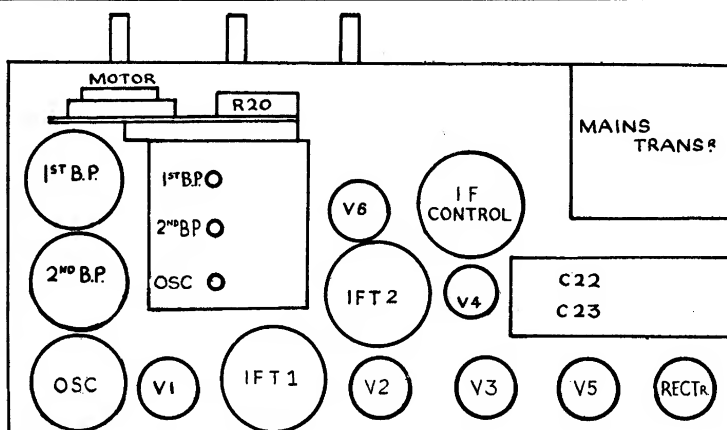
Tune the set to 200 metres and inject signal on this wavelength at A and E terminals. Screw up the aerial band-pass trimmer and then unscrew it one turn. Screw up the second B.P. trimmer, and unscrew it half a turn. Screw up the oscillator trimmer and reverse for one turn. Unscrew the oscillator

(Continued on opposite page.)



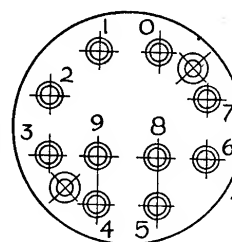


Automatic tuning worked from a "push-button" unit is the distinctive feature of the Aeromagic receiver.



Most of the components, including the relay, are arranged in orderly style inside the chassis.

The layout of the top of the Aerodyne chassis (above) gives some idea of the simple and compact nature of the condenser driving mechanism. In conjunction with the circuit, the diagram on the right provides the key to the leads in the cable to the control unit.



VALVE READINGS

No signal. V.C. max.

Valve.	Type.	Electrode.	Volts.	M.A.
1	FC4 met. (7)	anode	220	1.5
		aux. grid	60	3.1
		osc. anode	60	1.75
2	VP4B met. (7)	anode	220	10.5
		aux. grid	220	3.8
3	2D4A met. (5)	diode	—	—
4	VP4B met. (7)	anode	220	4.7
		aux. grid	220	1.9
5	Pen4VB (7)	anode	205	30
		aux. grid	220	3
6	354V met. (5)	anode	70	11-20*

* 20 m.a. when button is pressed.

(Continued from previous page.) tracking condenser, C8, three turns, and unscrew fully the L.W. pad, C24.

Adjust the band-pass and oscillator trimming condensers for maximum response at these settings of C8 and C24.

CONDENSERS

C.	Purpose.	Mfd.
4	V1 bias decoupling (B.P. coupling)	.05
5	V1 cathode by-pass	.1
6	V1 osc. grid	.0005
7	L.W. tracking (fixed)	.0015
9	V1 osc. anode decoupling	.1
10	V2 cathode by-pass	.1
11	Decoupling A.V.C. line	.1
12	V3 cathode return	.1
13	H.F. by-pass	.0001
14	L.F. feed to V4	.00003
15	L.F. coupling	.01
16	Feed to V6 grid	.02
17	L.F. by-pass, V6 anode	.1
18	Tone compensating V5 anode	.001
19	Tone control circuit	.05
20	V5 cathode by-pass	.25 (20)
21	Feed to motor	.2
22	H.T. smoothing	.8
23	H.T. smoothing	.8
31	A.V.C. diode feed	.00005
32	Series aerial	.00005
33	Mains aerial	.0002

Inject on 2,000 metres and (after switching to long waves) adjust C8 for maximum. (Do not adjust band-pass trimmers on L.W.)

Turn back to medium waves and try to improve the response by slight readjustments

RESISTANCES

R.	Purpose.	Ohms.
1	V1 grid decoupling	.5 meg (1/2 w.)
2	V1 cathode bias (fixed)	250 (1/2 w.)
3	Voltage dropping to V1 aux. grid	30,000 (1/2 w.)
4	V2 cathode bias (fixed)	140 (1/2 w.)
5	A.V.C. diode load	1 meg. (1/2 w.)
6	Decoupling A.V.C. line	1 meg. (1/2 w.)
7	Diode load	1 meg. (1/2 w.)
8	V4 bias feed	2 meg. (1/2 w.)
9	V4 cathode bias	1,000 (1/2 w.)
10	Crystal load	50,000 (1/2 w.)
11	V6 grid leak	10 meg. (1/2 w.)
12	V5 grid leak	1 meg. (1/2 w.)
13	H.F. stopper, V5 grid	100,000 (1/2 w.)
14	V5 cathode bias	140 (1/2 w.)
15	Tone control	0,000 ptr.
16	V6 H.F. decoupling	53,000 (1/2 w.)
17	Series with starting switch	15,000 (1 w.)
18	H.F. stopper	50,000 (1/2 w.)
19	V.C. in control unit	10,000 ptr.
20	Ptr. for tuning meter in control unit	1,750 ptr.
21	Stabilising relay	3,000 (1/2 w.)
22	V1 osc. grid leak	50,000 (1/2 w.)
	Speaker field	2,500

of the hand-pass and oscillator trimmers.

Replacing Chassis.—Lay the chassis inside the cabinet, replace holding screws, knobs, and the two wood screws holding the dial to the cabinet.